Exhibit IND18

IN THE UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

NEUROGRAFIX, a California corporation; WASHINGTON RESEARCH FOUNDATION, a not-for-profit Washington corporation,	)	
Plaintiffs,	)	No. CV 10-1990 (MRP)(RZX)
vs.	)	
SIEMENS MEDICAL SOLUTIONS USA, INC., a Delaware corporation and SIEMENS AKTIENGESELLESCHAFT, a German corporation,	)	
Defendants.	)	
AND RELATED CROSS-ACTION.	)	

VIDEOTAPED DEPOSITION OF

MICHAEL BRANT-ZAWADZKI, M.D.

Los Angeles, California

Tuesday, August 16, 2011

Reported By:

LISA MOSKOWITZ, CSR 10816, RPR, CLR

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9:55 a.m.

Videotaped Deposition of MICHAEL BRANT-ZAWADZKI, M.D., held at the offices of Russ, August & Kabat, 12424 Wilshire Boulevard, 12th Floor, Los Angeles, California, pursuant to Notice before Lisa Moskowitz, Certified Shorthand Reporter and Registered Professional Reporter of the State of California.

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ALSO PRESENT:
COURTNEY BATES, Videographer

THE VIDEOGRAPHER: This marks the start of disk No. 1 in the videotaped deposition of Michael Brant-Zawadzki in the matter of NeuroGrafix versus Siemens, et al., in the Central District Court of California, Western Division, Case No. CV 10-1990 (MRP)(RZX). This deposition is being held today at 12424 Wilshire Boulevard on the 12th floor in Los Angeles, California on August 16, 2011, at approximately 9:55 a.m. My name is Courtney Bates, and I'm here from TSG Reporting, Inc. I'm the legal video specialist, and I'm here with our court reporter, Lisa Moskowitz, in association with TSG Reporting.

At this time will counsel please give your appearances for the record.

MR. LoCASCIO: Sure. Gregg LoCascio and Chris Nalevanko on behalf of the defendants Siemens.

MR. FENSTER: Marc Fenster along with Fredricka Ung and Andrew Weiss on behalf of plaintiff NeuroGrafix and the

witness.

THE VIDEOGRAPHER: Thank you. And the reporter may now swear or affirm the witness.

M I C H A E L B R A N T-Z A W A D Z K I, M. D. called as a witness, having been duly sworn, was examined and testified as follows:

EXAMINATION

BY MR. LoCASCIO:

Q. Good morning, sir.

A. Morning.

Q. Can you pronounce your name just so I make sure I get it right.

A. Michael Brant-Zawadzki.

Q. Brant-Zawadzki?

A. Correct.

Q. You're a doctor; correct?

A. I am a doctor.

Q. Dr. Brant-Zawadzki, you have been hired by NeuroGrafix to provide expert testimony in this matter; correct?

A. Yes.

Q. And how much are you being paid an hour for your testimony?

so far are manually selected by the operator; right? 10:34

A. Yes, except maybe in the sense of -- well, yes. I would say yes.

Q. Are there ways to select an item in a region of interest on a scan that are automated? So, for instance, you get to the MRI machine and you -- there's technology that you push a button, and it selects a nerve or a tumor. 10:34

A. Well, there are thresholding methods; so all of the work stations we have today will give you preset windows, what we call windows where you create a threshold of the numbers you're going to disregard, call them black on this end and white on the other end. So you're going to disregard the whites and the blacks, and you threshold to the range of numbers that you think represents the regions of interest. So the structures of interest within that. 10:35

So there are automated thresholding methods which what they simply do is if you take an individual pixel, as we talked about, crosshair, and the lowest common denominator of the image is the intensity value within a 10:35

single picture volume element. So you can manually go through the range and say, "Okay, I want anything above this number white and anything above that number black." That can be done either manually or preset for you by the manufacturer so what we call bone windows or brain windows or lung windows, create automatic thresholding methods for demonstrating structures of interest. 10:35 10:35

Q. Are you aware of a preset for a nerve threshold that's automated such as the ones you just identified like bone or lung? 10:36

A. I'm not aware that there is a manufacturer-supplied thresholding window for a nerve. I've never seen that. But one can create that if one wants and build it into the machine so that the next time you walk up and you want the nerve threshold, you can do that. 10:36

Q. From a layperson standpoint if you wanted to find the brightest image or the brightest pieces of an image, can you threshold so you only get the top 20 percent or 10 percent of the brightest pixels and see just that portion of the image? 10:36

A. Yeah, you can -- the brightest 10:37

being -- so you can make anything bright. But when you say "brightest," the highest signal intensity values is what I assume -- 10:37

Q. It is. Thank you.

A. So the answer is yes. 10:37

Q. And would that be a thresholding analysis?

A. That would be an example of thresholding, yes.

Q. So if, for instance -- withdraw. 10:37

What's typically -- is there some anatomical feature that's typically the brightest thing in an MRI, or does it depend what pulse sequence you use?

A. It depends on the pulse sequence that one uses. 10:37

Q. T2 --

A. Brightest, again, visually.

Q. Highest intensity?

A. Well, so -- of a particular pulse sequence, yes. Depends on the sequence that one uses. 10:37

Q. Using T2 weighting is there something that typically has the highest signal intensity? 10:37

MR. FENSTER: Objection. Vague. 10:37

THE WITNESS: Using T2 weighting, I mean you can -- it depends, again, on vagaries of the pulse sequence. But T2 weighting is an inherent property of the 10:38 tissue. So the T2 of the structure is the T2 of the structure no matter what you do consequence-wise as long as it's at a given field strength.

So given a single magnet of a 10:38 defined field strength, the T2 is quantifiable for any tissue, and it's measurable. You can make that T2 be very bright, whatever that T2 is bright, or you can make it be dark depending on 10:38 how you design your pulse sequence.

I'm not sure I understand.

BY MR. LoCASCIO:

Q. T2-weighted sequence is typically described as two times, a relaxation time and 10:38 an echo time; correct?

A. There are different definitions. But T2-weighted sequences is anything that enhances the structures with long T2s compared to structures with short T2s. But, again, there 10:39

are gradations of T2 weighting. So the longest T2 that we look at in tissues is that of pure water. So you can have T2-weighted sequences that show water at white, or you can have T2-weighted sequences that show it black by using different pulses. 10:39 10:39

So it really -- one of the most confounding aspects of MR imaging is that it's multi-parametric. And the operator chooses the parameters for the purposes of the task at hand. 10:39

Q. And if you wanted to have nerves be the brightest images, is there a particular pulse sequence you would use to do that? Have you ever done that? Let's start with that. 10:39

A. Well, you know, again, I've done it within the limitations of the tools we have. As I explained, we do not have a neurographic packet. We didn't buy it. We didn't purchase it. So we don't do that. 10:40

If I'm asked to look at a heavily -- if I need to look at inflamed tissue, I will use a heavily T2-weighted sequence unless I use intravenous contrast, in which case I use a T1-weighted sequence. So it really depends on 10:40

the task at hand.

Q. Not using a contrast agent, you just said if you wanted to get an image to show the nerves, you'd use a T2-weighted sequence?

A. Again, I don't do imaging to show nerves specifically. So that's one of the concepts that the patent teaches is, "Hey, we have a technique here specifically for the issue of imaging peripheral nerves." We just don't have a practice that's geared to that. I know there are practices that promote that, that market that.

And if we were one of those, I'd maybe buy that, but we just don't have that kind of a practice in our setting. We are an acute hospital, community hospital setting. And so we do have out-patient imaging, but we're not asked to do that very often. So when we're asked to do that, we take whatever tools we have at hand and try to show the tissue and the nerve to the best degree that we can.

Q. And how do you do that?

A. Well, we'd use a -- depending on where it is. If it's in the neuroforamen, we'd use a T1-weighted sequence. If it's a request

for a brachial plexopathy because the patient has breast cancer, we would use both a T1-post-contrast-injected sequence and anatomic sequences that include T2 weighting. 10:41

Q. When you refer now to T2 weighting, what does that mean from an operator standpoint? Are there parameters that are input to the machine to create that sequence? 10:42

A. Yes. So we use what's called a long TR time. So we create the pulses in such a way to cancel out differences in T1 relaxation, the magnetization of the tissue. So we try to magnetize the tissue fully before we pulse again to demagnetize it. So the tissues start out at close to an equal point in intensity. And then we follow the decay curve and get echo samplings over a longer period of time to see differences in T2 decay. 10:42

And the tissue that decays less has a longer T2 than the tissue that decays more. So we enhance the slower T2 decay of one tissue versus another tissue. So that will show us spinal fluid is white, for instance, and brain is darker or neural tissue is darker. 10:42

Q. You identified a parameter a minute 10:43

ago, TR relaxation time? 10:43

A. T1 relaxation time. The TR interval is the interval between the original RF pulse that demagnetizes the tissue, if you will.

Q. And is there something called TE or echo time? 10:43

A. Yes.

Q. And in a T2-weighted sequence, what's the relationship between TR and TE?

A. What's the relationship between TR and TE? 10:43

Q. Are they comparable? Is one bigger than the other?

MR. FENSTER: Objection. Vague.

THE WITNESS: The TR is typically considerably longer than the TE. 10:43

BY MR. LoCASCIO:

Q. And so if someone in the art says to you they used a T2-weighted sequence, you know that means it has a long TR and a shorter TE. 10:43 Agreed?

A. Not a shorter TE. The sequence has a long TR and multiple TEs going out to -- so it's not a shorter TE necessarily. It can be, in fact, a long TE. 10:44

Q. The TE is shorter than the TR, isn't it. 10:44

A. Oh, yes, in the sense that -- but that's always the case. Almost always. I shouldn't say that. It's predominantly the case in conventional spin-echo imaging that TR is considerably longer than the TE. 10:44

Q. How long is the TR for it, in your mind, be T2 weighted?

A. Depends on the field strength. I don't want to get into the argument of what instrument is best or not. But let's say typically two seconds or more you're getting -- on most instruments you're getting out to where you're getting a T2-weighted image because a TR of two seconds will get you sufficient re-magnetization so that even the slower tissue catches up in terms of its magnetization to the faster tissue. So you're starting at the same point, and at that point you're looking mostly at T2 decay when you're looking at subsequent signals. 10:44 10:45

Q. Earlier you mentioned that you -- your facility -- which is what? Where do you work? 10:45

A. I work at predominantly Hoag Memorial Hospital. 10:45

Q. In San Diego?

A. Actually it's Newport Beach.

Q. What equipment do you use? 10:45

A. We use a variety of equipment. So GE, Siemens -- I think those are the two. We have one Toshiba magnet left in our arsenal, I think. It's a low-field magnet.

Q. Do you have MRI machines from all three providers, Toshiba, GE, and Siemens? 10:45

A. Yes, I think we still have the Toshiba. It's probably our oldest. It's in an outpatient facility, and it's, I think, our oldest piece of equipment. 10:46

Q. Is your Siemens equipment -- do you know what type it is?

A. Yes.

Q. What is it?

A. Well, we have a 3 Tesla Verio Siemens machine. We have a 1.5 -- we have a 3 Tesla Verio. We have a 3 Tesla Trio. These are brand names, mind you. 3 being -- 3 Tesla being the measurement to the field strength. We have a 1.5 Espirit, several. Do we still 10:46 10:46

have a 1.5 -- no, I think that's it. 10:46

Q. Do any of them have a neurography or a tractography package to image nerves specifically?

A. Not that I know of, no. 10:46

Q. Were you involved in the purchase of any of those machines?

A. Yes.

Q. Was a decision made not to buy such an option if one existed? 10:46

A. I don't even know that the option existed. I know that -- I know that we had an option to add on neurography through, I believe, NeuroGrafix. I don't know which company they were at the time. I know that the 10:47 market had the availability of purchasing an add-on, if you will. Because I remember being marketed by someone, some representatives in the distant past, "Gee, wouldn't you look to have a neurography package on your machine?" 10:47 So I know that was available. But I don't think Siemens provided that as an option.

As you know or you may not know or maybe the folks looking at this may not know, but there are -- when a manufacturer sells you 10:47

an MR instrument, you have multiple options. 10:47
You get the car, and you can get the navigation package if you want or you can get the rear camera if you want. So there are packages. I don't remember neurography being one of the 10:47 packages on the Siemens magnet.

Q. Do you believe that there were call them third-party vendors or at least a third-party vendor that offered an add-on? So sort of like you can put a nav system on your 10:48 car that wasn't from the manufacturer.

A. Well, I believe that -- my understanding was Dr. Filler's company offered that. And, again, because we were never really interested in doing that, there's other things 10:48 we're not interested in doing, we never pursued it. We never got competitors. I don't know if there are any other competitors or not.

Q. You mentioned you guys don't do that at your hospital, but you knew there were 10:48 places that specialized in nerve imaging. Who were you aware of that does that?

A. Well, I knew there was a -- Dr. Tsuruda had a site that he advertised because we'd occasionally get a dentist calling 10:48

requirement there. It says that there's a thresholding process to be used, and you can choose the range of thresholding processes, whether the ones we discussed earlier. 11:11

BY MR. LoCASCIO:

Q. In your view could you also select it manually?

MR. FENSTER: Objection. Vague.

BY MR. LoCASCIO: 11:11

Q. Based on your visual inspection of those fascicles?

A. Well, again, I think that if you had any question, you could resort to one of the tools that we talked about including the 11:11 single-voxel lens that you scroll across the image and say, "Okay, these are the range of numbers that I'm interested in, and this is where I'm going to measure the intensity." Or you could put an oval within which you visually 11:11 thought were the boundaries based on your training and experience and skill in the art.

Q. This section that you're pointing to, column 28, doesn't tell you how to do that, but in your view someone of skill in the art would 11:12

figure it out. Fair? 11:12

A. Yeah.

MR. FENSTER: Objection. Vague.

THE WITNESS: I think it's a combination of what this tells you how 11:12 to do that -- what this tells you to do, and it makes suggestions based on an assumption that someone with skill in the art fills in the components. It doesn't specify automated thresholding 11:12 versus manual versus oval window versus -- but it says thresholding.

So I think someone skilled in the art understands that, hey, you're going to use a visual threshold and place a 11:12 region of interest tool in there, or you're going to use a pixel thresholding method and draw it in. So the range of something -- of the things someone skilled in the art would be able to 11:12 understand is being prescribed, if you will, by this section.

BY MR. LoCASCIO:

Q. In your view if you select a different region of interest from one of your 11:13

colleagues, will the conspicuity calculation be different or the same? 11:13

MR. FENSTER: Objection. Vague, incomplete hypothetical.

THE WITNESS: So we talked about the range of inter-observer variability. So within that 5 to 10 percent range, there may be differences. But for the most practical purposes for the significant -- statistically significant majority of instances it would be the same. 11:13

BY MR. LoCASCIO:

Q. What's the source for your belief that there's a 5 to 10 percent range of inter-operator variability? 11:13

A. Just the summary of experience. I mean I've done -- I've written papers on inter-observer variability of and other things. I've read papers about it, inter-observer variability for relatively simple tasks, even ones that one would think would be extremely reproducible. We know that there's a range of inter- and intra-observer variability. 11:13

Obviously once one gets down to the 11:14

(Defendants' Exhibit 40 was marked for identification.)

BY MR. LoCASCIO:

Q. This has various images including ROIs, as you understand, were selected by Dr. Filler; true?

A. As I understand it, yes.

Q. If we look first at the second page which he calls figures 2A and 2B which is the page you're on in Exhibit 40, the green circles are ROIs; correct?

A. Yes. The blue and green. I think one of them is blue. Yes, the color circles.

Q. Those colored circles are different sizes and shapes. Agreed?

A. Yes.

Q. And in this instance am I correct, sir, that the call them the lower two circles on figure 2B are the nerve, and the higher or closer to the top of the page two circles are the non-neural tissue?

A. Yes. According to what I can see here.

Q. Is that a nerve that is in cross-section like we talked about it before or

a nerve that at this point is at least in part running in the plane of the image?

A. The latter.

Q. And Dr. Filler in this instance selected an ROI that is an ellipse or an oval inside of what appears to be that nerve as it runs through the plane of the image; correct? 14:06

A. Yes.

Q. He did not select the entire nerve; true? 14:06

A. True. Entire nerve and the full definition of that term.

Q. Do you believe that this method shown here by Dr. Filler is the method taught by the 360 patent of measuring an ROI to measure conspicuity? 14:07

A. I think it is one of them, much like -- very similar if not almost identical to the way Dr. Bryan did it. In certain of his examples, I should say. 14:07

Q. I want you to leave this out. And then your expert report that you had a minute ago, we were looking at paragraph 49. I want to turn back a couple of pages to paragraph 43.

A. Okay. 14:07

Q. Bottom of page 13 it says, "The claims themselves dictate this because they require taking the average signal intensity of the nerve, not a portion of the nerve." 14:07

Do you see that? 14:08

A. Yes.

Q. Is it your view, sir, that you need to measure -- you have to have an ROI that captures the whole nerve or only a portion of the nerve? 14:08

A. Well, the next sentence qualifies what you just read, 'Not a portion of the nerve, thus the person of skill will know to take an ROI that is representative of the nerve tissue." So the phrase "a portion of the nerve" in the preceding sentence that you used to me means something you're -- representative of nerve tissue. A portion of the nerve tissue and adjacent tissue is not what you do. You don't take a portion of the nerve and a portion of adjacent tissue. 14:08 14:08

The sentence immediately following that, "Person of skill will know to take an ROI that is representative of nerve the tissue." So "representative of nerve tissue" is meaning 14:09

limitation, Dr. Filler's calculations here would show it satisfies the conspicuity of 5 limitation in claim 19? 14:18

A. And the 1.1 obviously, yes.

Q. Look at figure 6. On the same DICOM data, Dr. Filler gets a conspicuity measurement of 4.56 using different ROIs; correct? 14:19

A. Yes.

Q. And we'll look at the next one, figure 7. Dr. Filler generates new ROIs and gets a conspicuity of 3.80. 14:19

Do you see that?

A. Yes.

Q. So at least with respect to this image, when Dr. Filler himself used three different settings on the DICOM data and three different ROIs. One of them fell over the 5 limitation of claim 19, and two of them fell below that; right? 14:19

A. Over or under, yes. 14:19

Q. The same data, the same scan, depending on how you measured it, would satisfy the 5 limitation or not satisfy it depending on the selection; true?

A. Yes. 14:20

Q. That's what this shows? 14:20

A. Yes. It speaks for itself.

Q. You looked at Dr. Bryan's images as well from his report; correct, sir?

A. Yes. 14:20

Q. I'll hand you what we'll mark as defendants 41.

(Defendants' Exhibit 41 was marked for identification.)

BY MR. LoCASCIO: 14:20

Q. And based on some of the earlier discussion today, I got the sense, sir, that sometimes you thought Dr. Bryan's ROI selections were not consistent with the teachings of the 360 patent, and sometimes they 14:20 were. Is that correct?

A. Yes.

Q. Can you walk me through the images in Exhibit C and tell me where you think Dr. Bryan's ROI placements or sizes, et cetera, 14:21 the selection of ROIs by Dr. Bryan are consistent with the teachings of the 360 patent and where they are not? Let me first ask are you capable of doing that as we walk through these? 14:21

A. Yes. 14:21

Q. Can you do that for me? And perhaps the easiest way is just to refer to the figure on the bottom. So the first one is Exhibit C, figure 1. And the ROIs are conveniently 14:21 numbered. So you can just sort of and walk through them and tell me if they are consistent with the 360 patent or in your view an opinion not consistent with the proper selection of an ROI. 14:21

A. Right. So just as an example, ROI No. 3 -- the selection of ROI No. 3 or No. 2 for that matter, neither one, shows what could be conceived of as the brightest area on an image. And Dr. Bryan, I think, would argue 14:22 that this is an example of how the patent is nonspecific or whatever the right term is because it allows a calculation where conspicuity of the nerve is actually lower than the, quote, surrounding, unquote, tissue; 14:22 right?

So to me that, again, is inconsistent because to me the understanding is you compare the conspicuity of the nerve with the nearby adjacent or surrounding tissue. So the more 14:22

appropriate region of interest in this case -- I don't even know if Dr. Bryan chose one on this particular image that's the most appropriate. In fact, I would argue he didn't. But that's an example of where, for the purposes of demonstration and argumentation, Dr. Bryan chose regions of interest that would dispel the patent. 14:22 14:22

Q. Let's do this in a more orderly fashion. Dr. Bryan identifies some as non-neural and some as nerve. Do you agree with his characterization of ROIs 1 through 11 on Exhibit C as being reflective of neural or non-neural tissue? 14:23

A. In general. I don't know that I would select those same exact spots. But, you know, No. 5, No. 6, No. 7 are neural tissue. Again, we talked earlier about the most representative segment, and I would say that No. 5 may not be the most representative segment of neural tissue that one skilled in the art would choose if one were doing what is instructed by the patent. So, again, depending on which specific ones we look at. 14:23 14:23

As far as the non-neural tissue, I 14:24

would suggest to you that Nos. 1, 2, 3, 4 -- let's see. 8 is bone; so I wouldn't select bone. So including 8, 9 -- what's 9 being pointed to? 14:24

Q. It goes down, I believe, sir. 14:24

A. All the way to the bottom right-hand corner?

Q. Bottom straight down.

A. I don't know where 9 is. But 10 and 11 certainly would not be the ones -- the vast majority, if not all, of the, quote, non-neural tissue. 11 he points to which is outside of any biological tissue as background. That would be a region where I might measure the noise. 14:24 14:25

So I think his choice of non-neural tissue is stretching the limits, if not beyond the limit -- well, it is beyond the limits of what is intended by the instructions of the patent which where you'd want to select would be immediately adjacent to -- I would submit right between 5 and 6 would be the best place, between 5 and 6 at about the 10 o'clock position above what is the obvious nerve trunk there. That would be where I would select as 14:25 14:25

immediately adjacent non-neural tissue. 14:25

So three of the regions of interest that he selects as neural tissue, I'd say 1 is very good, 2 is pretty good, and the uppermost is -- that's not where I would put it because 14:25 the nerve may be partially in and out of volume at that point. It wouldn't be representative of the whole nerve, if you will.

Q. 9 you said you couldn't figure out where that went. Do you see that the dotted 14:26 line? Straight from the yellow area mean and standard deviation, it goes straight down.

A. Oh, through the really bright spot?

Q. Uh-huh.

A. So that would not be either. I would 14:26 include that as non-neural -- that's one of the brightest objects on the image and clearly not what I would consider proper for background for a conspicuity measurement.

Q. You would agree, sir, that all of the 14:26 ones identified as non-neural are showing non-neural tissue; correct?

A. Yes.

Q. You said 11 you would use as a measurement of noise but not a comparison for 14:26

conspicuity; right? 14:26

A. 11 if -- I believe 11 is --

Q. It's the one above the shoulder.

A. Total black area, right, about any biological structure. 14:26

Q. Look at the table on the next page. Dr. Bryan -- you know Dr. Bryan didn't use No. 11 in his conspicuity calculations, did he?

A. I don't know which one -- you asked me where he put his ROI. So I don't know what 14:27 he used and what he didn't use until I look again at the number on the table. It doesn't look like he used No. 11. It looks like 1, 2, 3, 4, 8, 9, 10.

Q. And 11 says that has a mean intensity 14:27 of 6.4 and a standard deviation of 4; correct?

A. But is 11 -- again, I can't tell on this Xerox where 11 goes. Maybe you can tell me where 11 goes.

Q. See the dotted line right above 8 in 14:27 that area? It goes up to the right into that circle.

A. I see 8 and 11 is --

Q. No, no. 11 says area 0.088 centimeters, and then there's a line. 14:27

A. Yes, now I see it. It goes to that black area where I would consider maybe that's a background noise area. He didn't include -- yes, he didn't include No. 11. 14:27

Q. And 11 identifies that, as you think, noise of 6.4 as a mean and a standard deviation of 4; correct? 14:28

A. Yes.

Q. And standard deviation 4 means that 68 percent of the time the intensity in that window is going to be between 2.4 and 10.4? 14:28

A. Is it 95 percent or 60 -- so I don't know what the calculation is. Is it standard -- yeah, you're right. It's 60 -- you're right. 14:28

Q. It's one standard deviation?

A. One standard deviation, right.

Q. Which means that's the range of 68 percent of the data points in that region of interest? 14:28

A. Correct.

Q. And so the noise, according to that, in that region of interest ranges from 2.4 all the way to 10.4; correct?

A. Yes. 14:28

Q. And the noise is not taken into account in the 360 patent; correct? 14:28

A. Yes.

Q. Looking at the ROI, which nerve do you think is the best? 7 or 6? 14:29

A. I would say 7 -- let's see. Probably 7.

Q. 7 would indicate that 68 percent of the pixels in there are between -- what's that? 77.7, up to about 91 is their intensity? 14:29

A. Yes.

Q. And 1.1 is 10 percent more than the nerve or the background; correct? To measure conspicuity of 1.1, it's 10 percent or greater?

A. Yes. 14:29

Q. The noise in this image is on an order of magnitude of around 10 percent of that nerve intensity, isn't it?

A. Yes. But if you look at the absolute number even within the standard deviation, the lowest would be, let's say, 77 or so, 78; right? So 78 would be the lowest intensity, acceptable lowest intensity of the nerve. And the highest intensity of the noise would be 10. So we're still talking 7.8 to 1 signal-to-noise 14:30

ratio; right? 14:30

Q. Uh-huh. Your view is the noise is irrelevant?

A. Well, it's 10 percent or less, yeah.

Q. 10 percent is all you need to satisfy the conspicuity limation; correct? 14:30

A. Right.

Q. The noise is actually more than 10 percent, isn't it?

A. No. 14:30

Q. Isn't 10 percent of 77, 7.7?

A. But you're talking about the outside range. You're taking the worst case scenario as opposed to the mean. There's a reason why the term "mean" is used. 14:30

Q. And if you used what the patent said, a voxel-by-voxel basis, and you picked somewhere inside each of those ROIs, it could exceed 10 percent; right?

MR. FENSTER: Objection. Vague, incomplete hypothetical. 14:31

THE WITNESS: It's a hypothetical.

BY MR. LoCASCIO:

Q. That could turn out to change the -- whether the conspicuity is above or below 1.1? 14:31

A. Well, you have to take into account the background, yes. 14:31

Q. Can you turn to the next figure 2, please. I want to ask you about those ROIs. And my first question, sir, for all 11 of them is just this: Are the ones identified as nerve in your view nerve, and are the ones identified as non-neural not neural? And then we'll talk about whether you think they're best, worst, or eh. 14:31

MR. FENSTER: I'm curious how she spells that.

MR. LoCASCIO: I was too. I'll say so-so.

THE WITNESS: I agree with that. 14:32

BY MR. LoCASCIO:

Q. All the ones that Dr. Bryan identifies as nerve are nerve; correct?

A. Yes.

Q. And all the ones that he identifies as non-neural are non-neural; correct? 14:32

A. Again, I would argue that ROI No. 11 which he labels as nerve is partially nerve. It would not be representative of the nerve I would have chosen but -- and I would say that 14:32

ROI No. 8 is the most representative of the ROIs he chose as nerve. The other two are -- certainly contain nerve but to varying degrees less so than ROI No. 8. 14:32

Go ahead. 14:32

Q. Are any of these -- so let's take it in pieces. You agree that the nerve ROIs are all ones that someone with skill in the art could choose based on the teachings of 360?

A. I don't think they would choose ROI No. 11. I would say that they could possibly choose 10. I would say most of the time they would choose 8. 14:33

Q. And with respect to the non-neural tissue, are there some that you think the 360 patent would teach you could choose and some that you could not for non-neural? 14:33

A. To me the ROI that would be most appropriate would be the muscle, the areas just outside ROI 11 up above and down below, maybe the 12:30 and the 6:30 position adjacent to that ROI. That shows a nice representative example of background muscle tissue. Or you could go off to -- further away. You pick the nearby -- I think the patent teaches the nearby 14:33

adjacent tissue surrounding or adjacent tissues. I would choose that particular part of the musculature. 14:33

Q. And are any of the ROIs that are non-neural in your view acceptably chosen under the teachings of the 360 patent? 14:34

A. Well, not in this case, no. I think that, again, whoever chose that, I assume Dr. Bryan, was using them to make a point. They're not appropriately chosen under the teachings of the patent. 14:34

Q. Can you go to No. 3. Same first question. Are the non-neurals truly non-neural, and are the nerves truly nerve in your view? 14:34

A. Same answer. I think the most representative probably is either No. 13 or No. 6. As I quickly look at these, I would choose No. 13 as the most representative. And if you went directly outside of that circle into the dark musculature there, that would be the most appropriate non-neural. So maybe the most appropriate non-neural tissue would be 16 or possibly -- well, 16 would be of the ones that Dr. Bryan -- is this Bryan? 14:34 14:35

Q. Uh-huh. 14:35

A. Bryan chose -- I would say 16 would be perhaps the most representative of the ones he chose. Again, I would choose tissue closer to the trunks immediately adjacent. I would 14:35 go -- if you connect ROI 16 to ROI 13 and went down that line towards 13 just where that black -- the linear thing is, just inside of that or outside of that towards the 16 is where I would choose the immediately adjacent ROI for 14:35 teachings of the patent and my background in the skill in the art.

So I would choose 13, and I would choose a circle of the same size immediately adjacent separated by the black line bordering 14:36 the nerve in its upper portion.

Q. You said 13 or 6 before were the two -- you thought were the most representative of how it would be done in the 360 patent. 6 is all within the nerve; correct? It doesn't 14:36 go outside?

A. Well, 6 probably is. The edge of the ROI touches on the boundary or maybe just -- I don't know how many pixels may be beyond the nerve. Certainly 13 is entirely within the 14:36

nerve. And to me 13 is the most representative segment of the nerve. 14:36

So if I were trying to decide do I -- for my conspicuity measurement to satisfy infringement or not, I would choose 13, and I would choose non-neural tissue that's different than the choices presented here. 14:36

Q. And you agree that depending on who looked at this image, different radiologists could end up with different ROIs taken at different spots, and none of them would be wrong to do so? 14:37

MR. FENSTER: Objection. Vague and incomplete hypothetical.

THE WITNESS: Again, I can only say what my opinion is of skilled practitioner of the art. They would take the most representative segment of the nerve and the brightest portion and the most representative segment of the adjacent or surrounding tissue. That's not what was done in this case. So I don't know if this is how Dr. Bryan would act based on the teachings of the patent or this is how he would act 14:37 14:37

trying to discount the patent. 14:37

BY MR. LoCASCIO:

Q. Are there any of the non-neural selections that you think are acceptable under the teachings of the patent on Exhibit C, 14:37 figure 3?

A. Acceptable? Well, again, I don't. Because even if I were to accept No. 16 as representative, it's not surrounding or immediately adjacent to. So the answer is no, 14:38 I don't think so.

THE VIDEOGRAPHER: We have about five minutes left on this tape.

BY MR. LoCASCIO:

Q. Your opinions on all of these are 14:38 premised on the requirement that non-neural tissue in the claim language is adjacent; correct?

MR. FENSTER: Objection. Vague, misstates. 14:38

THE WITNESS: My premise -- state the first part again.

BY MR. LoCASCIO:

Q. Your opinion as to the appropriateness of the selection of these 14:38

non-neural tissue ROIs is premised on a requirement that they be adjacent to the nerve ROI; correct? 14:38

A. Adjacent, surrounding, nearby, whatever language, as opposed to far away or -- it's the tissue that's the background for the nerve. 14:38

Maybe I can give you another analogy. So the camera is looking at me right now. I have a blue shirt on. There's a relatively blue background. The field of view that we're talking about for measuring conspicuity to me and is limited to this versus this. Whereas if the field of view encompasses the room and includes the white wall, it's not fair to measure the intensity of the white wall; right? And that's what's being done here. 14:39 14:39

So to me conspicuity is how does something stand out from the background. You have to select the appropriate background. Not the wall over there even though it's in the image if the field of view of the camera is large enough to see that. I don't know. That's the videographer that can tell us. 14:39

So it's not fair to select the entire 14:39

image and select intensities out there. What you want to do is select this versus immediately adjacent non-shirt tissue and measure the difference. And that's not -- none of these do that, the non-neural tissue here. They select stuff fairly far outside. 14:39 14:39

Q. The patent inventors defined how they wanted to measure conspicuity here; right?

A. Yes.

Q. And they also were obligated to tell you how to come up with the ROI; correct? 14:40

MR. FENSTER: Objection. Vague.

THE WITNESS: Well, they were obligated to describe who the "you" is, which they did. They described who the "you" is. And then they described certain aspects of how to do it. So I tink they described the "you" which took certain -- took the art to a certain level, if you will, and then they described techniques to do that. 14:40 14:40

BY MR. LoCASCIO:

Q. Let me --

Oh, we need to change tape. Let's go ahead and do that. 14:40

THE VIDEOGRAPHER: This marks the end of disk No. 2 in the continuing deposition. The time is 2:40 p.m., and we're off the record. 14:40

(Recess taken from 2:40 p.m. to 2:59 p.m.) 14:40

THE VIDEOGRAPHER: This marks the beginning of disk No. 3 in the continuing deposition. The time is 2:59 p.m., and we are back on the record. 14:59

BY MR. LoCASCIO:

Q. We were looking, sir, at Exhibit 41 which were Dr. Bryan's exhibits. If you could turn to figure 6. 14:59

A. Yeah.

Q. It's page 11. Figure 6.

A. Sorry. Got it.

Q. Are those, in your view, proper selections of ROIs under the teachings of the 360 patent? 14:59

A. Again, not what I would have selected for the neural tissue. I would have selected much closer towards the spine along the nerve. It looks to me like both have some partial 14:59

volume of non-neural tissue within them. So I would have selected the nerve immediately below the two regions of interest or the same nerve more proximally or the contralateral nerve where it's homogeneous and definitive to the structure. 15:00 15:00

As for the immediately adjacent or surrounding non-neural tissue, I think ROI 2 is better than ROI 1, but it suffices.

Q. So 1 and 2 -- 15:00

A. I'm sorry. ROI -- let me make sure I said that. Actually it looks like ROI 2 may be -- actually it looks like they're partially volumed in those actually, both of those. I would have selected muscle tissue, and it that actually looks like there's some in-plane portion of nerve in there because it's all brachial plexus region. So I would have selected definitive muscle tissue and not what could be partially neural -- in fact, it is partially neural tissue. He calls it non-neural. I think it's partially neural. 15:00 15:01

Q. Do you know that or --

A. No. It looks -- it certainly looks that way. 15:01

Q. Is that something that with this image standing alone you know for a fact, or that's your interpretation? 15:01

A. Well, it certainly looks like as you go down the trunk it looks like it becomes a little bit more into the plane as a nerve. So, you know, I would not select that wondering -- I think thinking it's partially neural tissue. I would have selected -- for me the calculation would have been on the other side, on the left side of the spine where there's definitive nerve and definitive muscle immediately adjacent. 15:01

Q. Let's look at figure 7.

A. Okay. 15:01

Q. Are those nerve ROIs, in your view, consistent with the teachings of the 360 patent?

A. The -- it looks like there's some freehand drawings on the left side. The upper ROI is consistent, and the two on the left are consistent. I would choose the upper one more than the lower one, but they're consistent with it, yes. 15:02

Q. Okay. And so the two freehand 15:02

drawings on the left -- 15:02

A. Not the two. Just the upper one at most.

Q. Okay. What about the ones on the right? 15:02

A. The ones on the right, the uppermost one is the most optimal. I would have taken it a little bit further down where there's discrete nerve. There's that little very bright spot which could represented the 15:02 vascular structure signal superimposed. I would have taken it down a little bit lower.

If I were measuring for sure nerve and for sure adjacent tissue, I would measure just a smidgen further down the nerve on the 15:03 left than the topmost region of interest.

Q. That white spot just above and to the left at like 10 o'clock of the oval, is that neural or non-neural tissue?

A. I think that is brighter and suggests 15:03 to me a vascular structure. I would have to look at other images, adjacent images, or do other things to make sure of that. But to me it looks like there's a composite between either some spinal fluid and/or a vascular 15:03

structure and a nerve together.

Q. A vascular structure is non-neural; correct?

A. Yes.

Q. So right next to that oval is something that you believe may be non-neural tissue that's brighter than the oval; correct?

A. It could be some spinal fluid. It could be some non-neural tissue, yes.

Q. And that is brighter or higher conspicuity --

A. Yes.

Q. -- than the nerve next to it?

A. It obviously stands out more than what I consider to be the trunk of the nerve. But I wouldn't use that as nerve signal because it might give me too high a signal intensity for the calculation.

Q. And ROI 5, the pixel or really small area, is that within the nerve as taught by the 360 patent or not?

A. You can't -- I don't think you can use that.

Q. Why not?

A. Well, because it's too tiny an ROI

for what is a larger structure, and I think that larger structure is not homogenous in that region. It's partially in and partially out of the plane of the image. 15:04

Q. So in your view ROI 5 would not be something you would use when trying to measure an ROI under the 360 patent? 15:04

A. Correct.

Q. Because it's too small?

A. And because I'm not sure that it's the whole of the nerve as we discussed before. I think that there is portions -- there may be portions of that that is non-nerve, and it may be that that tiny ROI that was chosen is not within the nerve or does not contain nerve, not entirely within the nerve or contains no nerve. 15:04 15:05

Q. Let's look at figure 8, please. All ten of those ROIs show neural tissue; correct?

A. They show portions of neural tissue, yes. 15:05

Q. And all of those portions of the neural tissue result in, because they're different ROI selections, different signal intensities. Fair?

A. Yes. Again, the same argument. I 15:05

would select ones I was certain was the representative of nerve tissue which in this case would be ROI No. 7 -- let's see, 6 or 7? No. 6. That would be my selection. 15:05

Q. The patent doesn't say use what Dr. Brant-Zawadzki says to use. It says it's for what one of skill in the art might choose. Is it your opinion, sir, that every person of skill in the art would choose 6 and not the others? 15:05 15:06

A. I think that most people under the teaching of the patent would choose the most representative portion of the nerve which to me would me would be No. 6 or in the immediate vicinity of No. 6. 15:06

Q. What if you wanted one on the other side?

A. Well, you wouldn't want that because you want -- by definition under the patent you'd want the most representative portion of the nerve. 15:06

Q. Are those different nerves, the left side versus the right side?

A. No, they're all within the brachial plexus. But under the teachings of the patent, 15:06

you'd want the most representative portion of what you know is nerve. So even though they're the same general anatomic structure, you want the most -- what you're convinced of visually is the most representative portion of neural tissue which to me would be -- of the ones chosen here, would be No. 6. 15:06 15:06

Q. And are you saying, as you sit here today under oath, in your view of the patent all the other ROIs in this are wrong, and they could not be used according to the teachings of the 360 patent? 15:07

A. They should not be used by a trained observer in the art for choosing the most representative segment of neural tissue on this image. 15:07

Q. And it's your belief that the claims require to use an ROI that is most representative of any single nerve on the image? 15:07

A. That is my understanding of the patent, yes. For the purposes of documenting infringement; right?

Q. Let me show you what we'll mark as defense 42. 15:07

(Defendants' Exhibit 42 was marked for identification.)

BY MR. LoCASCIO:

Q. We talked about thresholding earlier today.

A. Yes.

Q. This is Dr. Bryan's rebuttal Exhibit 2. You've seen this before; correct?

A. Yes.

Q. And this is an example of using a software to threshold the brightest portions of Dr. Filler's Exhibit C; correct?

A. Yes.

Q. And this shows that at 10 percent, 30 percent, 40 percent, even 50 and beyond, the nerve is not shown using a signal intensity threshold; correct?

A. I think at 70 it is. Did you say -- I forgot what you --

Q. I got up to 50.

A. Okay. 60, 70, work backwards. So you got up to -- yeah, 50 I would say you cannot tell definitive neural tissue.

Q. And so the --

A. At 60 I think you're beginning to see

nerve in it. Certainly at 70 you do. 15:08

Q. So if you use a threshold to just take the highest signal intensity, using the image by Dr. Filler, you don't see the nerve when you threshold at the top 10, 30, 40, or 15:09 even 50 signal intensity; correct?

A. Correct.

Q. You don't dispute that analysis or data, do you?

A. Well, no, I don't. There are little 15:09 individual tiny dots which may show nerves. But you'd have to use other methods to see if that's really nerve or not. So definitively just using the threshold image, single image without a set of images, within that context 15:09 you're right.

Q. As you're sitting here today, sir, is there anything about your opinions that you think now that we've gone through your deposition is incorrect and needs to be changed 15:09 or corrected?

A. I don't know that I can even think anymore; so I'd say no.

Q. Anything about your answers today that you believe was inaccurate or needs to be 15:09

corrected? 15:09

A. Not as I sit here right now.

Q. Have you talked to NeuroGrafix's lawyers about any questions they want to ask you or answers they want you to give? 15:10

A. We talked about several items that they raised and I think he's going to ask me.

Q. Did you talk about what the questions would be or what the answers would be?

A. We talked about what the questions -- 15:10 the general context of questions might be.

Q. Any discussion about what the answers would be?

A. Well, no. I mean I think -- no, I don't know the answers. It's like region of 15:10 interest sampling as you're trying to suggest. It will be in the ballpark of opinions I've had before. They were checking to see if my opinions were still my opinions. So that's representative of what the answer you're 15:10 looking for.

Q. Did they tell you what to say and what not to say?

A. No.

Q. Did you practice it at all? 15:10

A. No. It was ballpark stuff.

MR. LoCASCIO: Okay. At this point no further questions for this witness.

MR. FENSTER: I want to go off the record for a minute.

THE VIDEOGRAPHER: The time is 3:11 p.m., and we are off the record.

(Recess taken from 3:11 p.m. to 3:12 p.m.)

THE VIDEOGRAPHER: The time is 3:12 p.m., and we are back on record.

EXAMINATION

BY MR. FENSTER:

Q. Dr. Brant-Zawadzki, can you take a look at Defendants' Exhibit 11, which is the 360 patent at column 14. And at column 14 at line 56, there is a discussion that the ROI may be a single pixel or voxel or a larger region, and it goes on to describe that it can be performed -- that ROI selection can be performed manually or automatically.

Do you see that?

A. Yes.

Q. Is it your understanding that one of

skill in the art would understand this to suggest that an ROI could be any size for a given image? 15:13

MR. LoCASCIO: Objection. Leading.

THE WITNESS: No, I don't think that's what the patent suggests. 15:13

BY MR. FENSTER:

Q. What is your understanding of the patent's discussion of several different methods of selecting ROIs? 15:14

A. Well, I think we covered this before. But it suggests a set of tools within a prescribed tool kit that one would use in a particular circumstance. So, for instance, most of what we've covered here today in terms of image and ROIs was in plain imaging of the nerve, the longitudinal description of a nerve as opposed to a cross-sectional. For that purpose the patent teaches use of common, very common region of interest tools, an oval or a circle being shown by Dr. Filler and Dr. Bryan commonly in the exhibits that we discussed before. 15:14 15:14

The pixel or voxel methodology, as I pointed out in one of the images, where the 15:14

region of interest chosen by Dr. Bryan was what looked like a single voxel, that would be inappropriate for use in a longitudinal data set. It would be more appropriate for use by one skilled in the art for cross-sectional images where a checkerboard pattern is shown. And one may want to use a crosshair to determine the family of voxels representing the fascicular bundle of nerves. 15:14 15:15

So I think the patent provides and prescribes a set of tools within a tool kit, each tool commonly used for one purpose versus another purpose. A different tool might be used for the cross-sectional purpose versus the longitudinal purpose. It allows for some degree of choice, whether it's a circle or an elliptical choice. 15:15 15:15

I think that's, again, something that an observer skilled in the art would use reproducibly most of the time and others like him or her would use reproducibly most of the time to select the most representative segment of the nerve and place the region of interest, whether it's a circle or slight oval within that region of interest, to determine the 15:15 15:16

THE VIDEOGRAPHER: This marks the end of disk No. 3 and is the end of today's deposition. The time is 3:36 p.m. We're now off the record. 15:36

(Time noted: 3:36 p.m.) 17:37

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MICHAEL BRANT-ZAWADZKI, M.D.

Subscribed and sworn to before me this day of , 2011.

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(Notary Public)

My Commission expires: _____